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Device of heating of the high part and the low part of the cockpit of a vehicle

The invention relates to a device of heating and ventilation, or air-conditioning, cockpit of a vehicle, including/understanding means to send air to adjustable temperature in the upper part of the cockpit, these means defining a first way of reheating of air crossed by a first exchanger of heat, and a way of transmission of air cold, mutually laid out into parallel and emerging together downstream in a zone of mixing, and means to send of 1 heated air in the low part of the cockpit.

The reheating of the sent air in the upper part and the low part of the cockpit can be useful either for the heating of the cockpit in winter, or for the adjustment of the temperature of the air of air-conditioning previously cooled by an evaporator.

In the known devices of this kind, this reheating is done exclusively in the first way of reheating of air, in contact with the first exchanger of heat. The heated draught is then divided into a fraction which is sent in the upper part of the cockpit, and another fraction which is sent in the low part of the cockpit. It is thus necessary to envisage conduits to bring the heated air to mouths of heating or ventilation relatively distant the ones from the other ones, which implies, for some at least these long conduits, ways and generally complexes, generators of losses of flow.

The purpose of the invention is to cure these disadvantages.

Another purpose is to facilitate the installation of the device in a reduced space.

- ▲ top The invention aims especially a device of the defined kind in introduction, and provides that the means to send heated air in the low part of the cockpit comprise a second exchanger of heat of reheating, placed lower than the first exchanger of heat.

This provision makes it possible to forward a flow of air to the upper part of the cockpit and a flow of air for the low part of the cockpit, according to single and short ways' generally directed to the top and to the bottom respectively starting from a same point, each one of these ways through exchanging own sound of heat for the reheating of the air. Moreover, each one of these exchangers must provide a lower calorific power, and is consequently of smaller size, than a single exchanger. In general rule, it is easier to place two small exchangers separately than a larger exchanger in a reduced space. The power and the size of the exchanging first of heat can be reduced still more when it is envisaged electric means of de-icing of the windshield.

Other features, complementary or alternative, device according to the invention are stated hereafter - It includes/understands a control common bringing of the air to a zone of distribution from which leave to the top the aforementioned first way of reheating of air and the aforementioned way of transmission of cold air, and to the bottom a second way of reheating of air crossed by the aforementioned second exchanger of heat.

- It includes/understands means of output control of flowing air in the second way of reheating of air.

- Common control contains at least a taken element among a ventilator, a filter and an evaporator of air-conditioning.

- The zone of mixing is in communication with an aerator own to direct a flow of air coming of this one towards the inner one of the cockpit.

- It includes/understands means of distribution laid out in the area downstream of the aforesaid first way of reheating of air to order in an adjustable way the passage of the flowing draught in this one towards the zone of mixing and/or at least a nozzle own to send this draught towards the windshield of the vehicle.

- The means of distribution comprise a pivoting aspect around an horizontal axis located immediately below the instrument panel of the vehicle, integral of a control member making covered above of the aforesaid the instrument panel.

The features and advantages of the invention will be more exposed in detail in description hereafter, while referring to the annexed drawing, of which the single figure is a schematic representation of a device of air-conditioning according to the invention.

The illustrated device includes/understands a common control of treatment of air 1 container a ventilator 2, a filter 3 and one evaporator 4. Ventilator 2 fact of circulating in control 1 of the bled air in a known way outside and/or inside the cockpit, thanks to inlets of air not represented. The draught thus product crosses successively filter 3 and evaporator 4, this last being cooled by fluid cooling when one wishes to send in the cockpit of the air itself cooled. The air circulates in control 1 according to a substantially horizontal, parallel direction with the longitudinal axis of the vehicle, and towards the rear one of this one. Control emerges in a zone of distribution 5 from which three ways are offered to the air, according to the position of two pivoting shutters 6 and 7. Shutter 6, refer shutter of mixing, can swivel between a first indicated position in full feature and a second indicated position in stopped feature.

When it is in its first position, it opens a direct way F1 between the zone of distribution 5 and one adjacent zone of mixing 8 with one or more upper aerators 9 placed on the rear edge of the panel instrument 11 of the vehicle and own to direct the air towards the inner one of the upper part of the cockpit. When shutter 6 is in its second position, it makes it possible the air to follow, from the zone of distribution 5, a way of reheating of air through F2 a radiator 10 traversed by the liquid one of cooling of the heat engine of the vehicle. Radiator 10 is placed above control 1, and below the instrument panel 11. The displacement of shutter 6 in intermediate positions sharing the air flow in way adjustable enters the ways F1 and F2.

Above radiator 10 is laid out a shutter of distribution 12 which can swivel around an horizontal axis 13 placed immediately below the instrument panel 11, under the action of a knurled control knob 14 which makes covered above this one. Shutter 12 is directed generally downwards starting from axis 13, and obliquely towards the front of the vehicle in a first indicated extreme position in full feature and obliquely towards the rear one in one second indicated extreme position in stopped feature. In this first position, it deviates towards rear substantial fraction of the air flow having crossed radiator 10 to send it in the zone of mixing 8, where it mixing if necessary with the air having followed the F1 way. The remainder of the air having crossed the radiator is sent towards windshield 15 by one or more nozzles of de-icing/demisting 16. In its second extreme position, shutter 12 separates the zone from mixing 8 of the space located downstream from radiator 10, so that the totality of the air having crossed this one arrives at nozzles 16. The sent heated air flow in the zone of mixing and consequently through aerator 9 can be controlled progressively by the displacement of shutter 12.

The third way of air F3, directed generally downwards starting from the zone of distribution 5, is ordered by the shutter 7 which can swivel between a position of closing, indicated in full feature on the figure, and a position of full indicated opening in stopped feature. When shutter 7 is in position of closing, the totality of the draught coming of control 1 is sent in the F1 way and/or the F2 way. When it is in its position of full opening, the following air flow the F3 way is maximum. This way crosses a mounted radiator 17 into parallel with radiator 10 in the coolant circuit of the heat engine. Radiator 17 is laid out below control 1 and is directed, like radiator 10, substantially according to planar horizontal. The F3 way succeeds, below radiator 17, with at least a mouth 18 of heating of the former low part of the cockpit, and with a channel

▲ top 19 leading to at least a mouth of heating not represented of the rear low part.

The circulation of liquid of cooling in radiators 10 and 17 is ordered by a tap 20.



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Claims

1. Device of heating and ventilation, or air-conditioning, the cockpit of a vehicle, including/understanding means to send air to adjustable temperature in the upper part of the cockpit, these means defining a first way (F2) of reheating of air crossed by a first exchanger of heat (10), and a way of transmission of air cold (F1), mutually laid out into parallel and emerging together downstream in a zone of mixing (8), and means to send heated air in the low part of the cockpit, characterized in that these last means comprise a second exchanger of heat (17) of reheating of air, placed lower than the first exchanger from heat, 2. Device according to claim 1, characterized in that it includes/understands a common control (1) bringing air to a zone of distribution (5) from which leave to the top the aforementioned first way of reheating of air and the aforementioned way of transmission of cold air, and to the bottom a second way (F3) of reheating of air crossed by the aforementioned second exchanger of heat.

3. Device according to claim 2, characterized in that it includes/understands of the means (7) of output control of flowing air in the second way of reheating of air.

4. Device according to one of the claims 2 and 3, characterized in that common control contains at least a taken element among a ventilator (2), a filter (3) and an evaporator of air-conditioning (4).

5. Device according to one of the preceding claims, characterized in that the zone of mixing is in communication with an aerator (9) own to direct a flow of air coming of this one towards the inner one of the cockpit.

▲ top 6. Device according to one of the preceding claims, characterized in that it includes/understands of the means of distribution (12) laid out in the area downstream of the aforesaid first way of reheating of air to order in an adjustable way the passage of the flowing draught in this one towards the zone of mixing and/or at least a nozzle (16) own to send this draught towards the windshield (15) of the vehicle.

7. Device according to claim 6, characterized in that the means of distribution comprise an aspect (12) pivoting around an horizontal axis (13) located immediately below the instrument panel (11) of the vehicle, integral of a control member (14) making covered above of the aforesaid the instrument panel.